Determination of Stream Biological Integrity Based on Fish Population Surveys

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Biographical Sketch of Author
Karyn Molines is the naturalist and education coordinator for the Jug Bay Wetlands Sanctuary. Since 1995, she has coordinated several ecological monitoring studies of freshwater tidal and nontidal systems. Over fifty volunteers assist her with fish population surveys, benthic macroinvertebrate sampling, amphibian studies (with specific efforts in monitoring the breeding migration of Ambystoma opacum), and plant inventories. She will receive her Masters in Environmental Science and Policy from Johns Hopkins University on May 21, 2004.

Abstract
We have conducted fish population surveys in the tidal and nontidal waters in Maryland's Coastal Plain geophysical province since 1987. Two study sites were shallow Patuxent River tidal flats, two were nontidal permanent creeks, and one was a beaver pond, all within the Jug Bay Wetlands Sanctuary, in Lothian, Maryland. In 1993 we began using 4-m and 10-m seine nets to capture the fish. We developed a seining technique in 1997 to standardize the Farm Point data. We collected data on species composition, size, and habitat use. We identified 45 species at the five sites. Seven species were common to all sites. Species diversity varied by tidal regime as well as by habitat. Striped bass and hogchokers were found only in the tidal sites, while rosy-sided dace and least brook lamprey were found only in the nontidal creeks. The two creeks had similar species composition, yet the dominant species varied. The two tidal sites had similar species composition, whereas the beaver pond supported both tidal and nontidal fish species. Species diversity and abundance were used to determine an Index of Biotic Integrity for the nontidal creeks. Volunteers were critical partners in collecting and identifying fish. This study demonstrated the valuable role volunteers play as "citizen scientists" in collecting biological monitoring data.